HIGH ELECTRON MOBILITY DEVICES

Abstract

The present invention is directed to high frequency, high power or low noise devices such as low noise amplifiers, amplifiers operating at frequencies in the range of 1 GHz up to 400 GHz, radars, portable phones, satellite broadcasting or communication systems, or other devices and systems that use high electron mobility transistors, also called hetero-structure field-effect transistors. A high electron mobility transistor (HEMT) includes a substrate, a quantum well structure and electrodes. The high electron mobility transistor has a polarization-induced charge of high density. Preferably, the quantum well structure includes an AlN buffer layer, an un-doped GaN layer, and an un-doped InAlN layer.